

I CLAIM:

1. An elongate viewing assembly for use as part of an endoscope, comprising:

5 a) a flexible main portion bendable between a relaxed configuration and a strained configuration and carrying an imaging optical fiber and an illumination optical fiber; and

10 b) a distal portion connected to the main portion and having a distal end that is offset laterally from the main portion.

2. The viewing assembly of claim 1, wherein the distal portion is substantially rigid.

3. The viewing assembly of claim 1 wherein the distal portion has a pre-curved rest orientation.

15 4. The viewing assembly of claim 1, wherein the offset of the distal end is in the range of about 1 millimeter to about 5 millimeters.

20 5. The viewing assembly of claim 1, wherein the distal portion has a diameter in the range of about 2 millimeters to about 5 millimeters.

25 6. The viewing assembly of claim 1, wherein the distal portion has a proximal end, the proximal end having an axis axially aligned with the main portion and the distal end having an axis diverging distally at an acute angle relative to the axis of the proximal end.

7. The viewing assembly of claim 1, wherein the main portion and distal portion comprise substantially dissimilar materials.

30 8. The viewing assembly of claim 1, wherein the main portion and distal portion comprise substantially similar materials.

9. The viewing assembly of claim 1, wherein the main portion includes a sheath comprising polymeric material.

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10. The viewing assembly of claim 1, wherein the distal portion includes a tube comprising metal material.

11. The viewing assembly of claim 1, wherein the main portion and distal portion are integrally constructed.

12. An elongate viewing assembly for use as part of an endoscope, comprising:

a) a flexible main portion bendable between a relaxed configuration and a strained configuration and carrying an imaging optical fiber and an illumination optical fiber; and

b) a substantially rigid distal portion connected to the main portion and diverging distally at an acute angle relative to the main portion.

13. The viewing assembly of claim 12, wherein the acute angle is in the range of about 3 degrees to about 30 degrees.

14. The viewing assembly of claim 12, wherein the acute angle is in the range of about 10 degrees to about 25 degrees.

15. The viewing assembly of claim 12, wherein the acute angle is in the range of about 15 degrees to about 30 degrees.

16. The viewing assembly of claim 12, wherein the acute angle is in the range of about 15 degrees to about 25 degrees.

17. The viewing assembly of claim 12, wherein the acute angle is about 20 degrees.

18. The viewing assembly of claim 12, and further including an eyepiece.

19. An viewing assembly for use as part of an endoscope, comprising:

a) a flexible portion, having an axis, that is bendable between a relaxed configuration and a

strained configuration in which the radius of curvature is less than about 2 inches, and that rebounds elastically at least about halfway from the strained configuration to the relaxed configuration; and

5 b) a substantially rigid portion having a first end and a second end, the first end having an axis coaxial with the axis of the flexible portion, the second end having an axis diverging distally at an acute angle relative to the axis of the first end, the acute
10 angle being in the range of about 3 degrees to about 30 degrees.

20. The viewing assembly of claim 19, wherein the acute angle is in the range of about 10 degrees to about 25 degrees.

15 21. The viewing assembly of claim 19, wherein the acute angle is in the range of about 15 degrees to about 30 degrees.

22. The viewing assembly of claim 19, wherein the acute angle is in the range of about 15 degrees to about
20 25 degrees.

23. The viewing assembly of claim 19, wherein the acute angle is about 20 degrees.

~~24.~~ A viewing assembly for use as part of an endoscope having an eyepiece, comprising:

25 a proximal body having an eyepiece connector;
 an elongate member connected to the proximal body, the elongate member having a main portion and a distal portion; and

 an imaging optical fiber bundle disposed
30 within the main portion and the distal portion;

 the main portion being elastically flexible and the distal portion being substantially rigid and having a first end and a second end, the second end being angularly disposed relative to the first end.

FOOTNOTES

25. The viewing assembly of claim 24, wherein the second end is angularly disposed at an acute angle in the range of about 3 degrees to about 30 degrees.

5 26. The viewing assembly of claim 24, wherein the second end is angularly disposed at an acute angle in the range of about 10 degrees to about 25 degrees.

27. The viewing assembly of claim 24, wherein the second end is angularly disposed at an acute angle in the range of about 15 degrees to about 30 degrees.

10 28. The viewing assembly of claim 24, wherein the second end is angularly disposed at an acute angle in the range of about 15 degrees to about 25 degrees.

15 29. The viewing assembly of claim 24, wherein the second end is angularly disposed at an acute angle of about 20 degrees.

30. An viewing assembly for use as part of an endoscope, comprising:

20 a) a flexible portion that is bendable between a relaxed configuration having a radius of curvature no less than about four inches and a strained configuration having a radius of curvature less than about two inches, and that rebounds elastically from the strained configuration at least about half way to the relaxed configuration; and

25 b) a distal portion traversing a bend in the range of about 3 degrees to about 30 degrees.

31. The viewing assembly of claim 30 wherein the distal portion is substantially rigid.

30 32. The viewing assembly of claim 30 wherein the distal portion is pre-curved in a relaxed configuration.

33. The viewing assembly of claim 30, wherein the substantially rigid portion traverses a bend in the range of about 10 degrees to about 25 degrees.

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34. The viewing assembly of claim 30, wherein the substantially rigid portion traverses a bend in the range of about 15 degrees to about 30 degrees.

5 35. The viewing assembly of claim 34, wherein the substantially rigid portion traverses a bend in the range of about 15 degrees to about 25 degrees.

36. The viewing assembly of claim 34, wherein the substantially rigid portion traverses a bend of about 20 degrees.

10 37. An endoscope comprising:
a handle;
a light source;
an optical eyepiece; and
a viewing assembly including an elongate
15 member operably connectable to the handle, light source and optical eyepiece, and having a flexible main portion bendable between a relaxed configuration and a strained configuration, and a substantially rigid distal portion connected to the main portion and having a distal end
20 offset laterally from the main portion.

38. The endoscope of claim 37, wherein the offset of the distal end is in the range of about 1 millimeter to about 5 millimeters.

25 39. The endoscope of claim 37, wherein the distal portion has a diameter in the range of about 2 millimeters to about 5 millimeters.

40. The endoscope of claim 37, wherein the distal portion has a distal tip having a diameter greater than that of the distal portion.

30 41. A method of viewing a curved endotracheal tube in an intubated patient, comprising the steps of:

a) providing an endoscope with an elongate light guide having a flexible main portion and a distal portion having a distal end that is laterally offset
35 from the flexible portion;

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b) inserting the light guide into the endotracheal tube with the distal end offset in the direction of curvature of the endotracheal tube; and

5 c) advancing the light guide within the endotracheal tube such that the distal end is offset from the endotracheal tube.

42. The method of claim 41, wherein the distal portion is substantially rigid.

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